

Serial No.: 10/646,545

Confirmation No.: 9714

Filed: August 21, 2003

For: MEDICAL LEAD CONNECTOR SYSTEMS WITH ADAPTERS (as amended)

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Previously Presented) A medical system comprising:
 - an implantable medical device including a connector bore, the connector bore comprising one or more conductive connector block portions along an inner surface;
 - a single lead connector including a plurality of lead connector elements electrically isolated from one another and spaced apart along the single lead connector;
 - a plurality of elongated insulated conductors;
 - a plurality of lead electrodes, each electrode of the plurality of lead electrodes coupled to a corresponding lead connector element of the plurality of lead connector elements via the plurality of elongated insulated conductors; and
 - a set of adapters, wherein each adapter of the set of adapters is configured to be used separately from one another to electrically connect the single lead connector to the implantable medical device, wherein the set of adapters comprise:
 - a first adapter extending from a proximal end to a distal end, wherein the first adapter comprises:
 - an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,
 - an internal surface forming a lumen to receive the single lead connector, electrically isolative material defining at least a portion of the internal surface, and
 - one or more electrical contact elements, wherein each electrical contact element of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the

Serial No.: 10/646,545

Confirmation No.: 9714

Filed: August 21, 2003

For: MEDICAL LEAD CONNECTOR SYSTEMS WITH ADAPTERS (as amended)

external surface, wherein the one or more electrical contact elements are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the single lead connector is received within the lumen; and a second adapter extending from a proximal end to a distal end, wherein the second adapter comprises:

an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,

an internal surface forming a lumen to receive the single lead connector electrically isolative material defining at least a portion of the internal surface, and

one or more electrical contact elements, wherein each electrical contact element of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the external surface, wherein the one or more electrical contacts are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the single lead connector is received within the lumen,

wherein the one or more conductive portions of the external surface of the first adapter that are electrically coupled to the one or more electrical contact elements of the first adapter are located in the same location along the external surface thereof as the one or more conductive portions of the external surface of the second adapter that are electrically coupled to the one or more electrical contact elements of the second adapter, wherein at least one electrical contact element of the one or more electrical contact elements of the first adapter is located in a different

Serial No.: 10/646,545

Confirmation No.: 9714

Filed: August 21, 2003

For: MEDICAL LEAD CONNECTOR SYSTEMS WITH ADAPTERS (as amended)

location along the internal surface thereof than the one or more electrical contact elements of the second adapter, wherein at least a portion of the electrically isolative material of the first adapter is located in the same location along the internal surface thereof as at least one of the one or more electrical contact elements of the second adapter, and further wherein at least a portion of the electrically isolative material of the second adapter is located in the same location along the internal surface thereof as at least one of the one or more electrical contact elements of the first adapter.

2. (Previously Presented) The medical system of claim 1, wherein the external surface of each of the first and the second adapter conforms to an industry standard.

3. (Previously Presented) The medical system of claim 1, wherein the lead connector further includes a connector ring positioned distal to the plurality of lead connector elements for electrical connection within the connector bore.

4. (Previously Presented) The medical system of claim 3, wherein the lead connector further includes a plurality of sealing rings positioned distal to the plurality of connector elements, a first sealing ring of the plurality of sealing rings positioned proximal to the connector ring and a second sealing ring of the plurality of sealing rings positioned distal to the connector ring.

5. (Previously Presented) The medical system of claim 1, wherein each lead connector element of the plurality of lead connector elements includes an outwardly extending protrusion.

6. (Previously Presented) The medical system of claim 1, wherein the lumen of the first adapter is dimensioned to form a press fit about the plurality of lead connector elements when the plurality of lead connector elements is received within the lumen of the first adapter, and wherein the lumen of the second adapter is dimensioned to form a press fit about the plurality of

Serial No.: 10/646,545

Confirmation No.: 9714

Filed: August 21, 2003

For: MEDICAL LEAD CONNECTOR SYSTEMS WITH ADAPTERS (as amended)

lead connector elements when the plurality of lead connector elements is received within the lumen of the second adapter.

7-10. (Canceled)

11. (Previously Presented) A method for coupling a lead connector comprising a plurality of lead connector elements to an implantable medical device including a connector bore, the connector bore comprising one or more conductive connector block portions along an inner surface, the method comprising:

selecting an adapter from a first adapter and a second adapter, wherein each adapter of the first adapter and the second adapter is configured to be used separately from one another to electrically connect the lead connector to the implantable medical device, wherein the first adapter extends from a proximal end to a distal end, wherein the first adapter comprises:

an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,

an internal surface forming a lumen to receive the lead connector,

electrically isolative material defining at least a portion of the internal surface,

and

one or more electrical contact elements, wherein each electrical contact element of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the external surface, wherein the one or more electrical contact elements are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the lead connector is received within the lumen, and

Serial No.: 10/646,545

Confirmation No.: 9714

Filed: August 21, 2003

For: MEDICAL LEAD CONNECTOR SYSTEMS WITH ADAPTERS (as amended)

wherein the second adapter extends from a proximal end to a distal end, wherein the second adapter comprises:

- an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,

- an internal surface forming a lumen to receive the lead connector,
- electrically isolative material defining at least a portion of the internal surface,
- and

- one or more electrical contact elements, wherein each electrical contact element of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the external surface, wherein the one or more electrical contact elements are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the lead connector is received within the lumen,

- wherein the one or more conductive portions of the external surface of the first adapter that are electrically coupled to the one or more electrical contact elements of the first adapter are located in the same location along the external surface thereof as the one or more conductive portions of the external surface of the second adapter that are electrically coupled to the one or more electrical contact elements of the second adapter, wherein at least one electrical contact element of the one or more electrical contact elements of the first adapter is located in a different location along the internal surface thereof than the one or more electrical contact elements of the second adapter, wherein at least a portion of the electrically isolative material of the first adapter is located in the same location along the internal surface thereof as at least one of the one or more electrical contact elements of the second adapter, and further wherein at least a portion of

the electrically isolative material of the second adapter is located in the same location along the internal surface thereof as at least one of the one or more electrical contact elements of the first adapter; and
positioning the lead connector within the lumen of the selected adapter.

12. (Previously Presented) The method of claim 11, further comprising positioning the selected adapter within the connector bore of the implantable medical device.

13. (Previously Presented) A kit for coupling a lead connector having a plurality of lead connector elements within a connector bore of an implantable medical device, the connector bore comprising one or more conductive connector block portions along an inner surface, the kit comprising:

a first adapter extending from a proximal end to a distal end, wherein the first adapter comprises:

an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,

an internal surface forming a lumen to receive the lead connector,
electrically isolative material defining at least a portion of the internal surface,
and

one or more electrical contact elements, wherein each of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the external surface, wherein the one or more electrical contacts are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the lead connector is received within the lumen; and

a second adapter extending from a proximal end to a distal end, wherein the second adapter comprises:

- an external surface to engage the inner surface of the connector bore, wherein the external surface comprises one or more conductive portions to electrically engage the one or more conductive connector block portions of the connector bore of the implantable medical device,

- an internal surface forming a lumen to receive the lead connector,
- electrically isolative material defining at least a portion of the internal surface,
- and

- one or more electrical contact elements, wherein each electrical contact element of the one or more electrical contact elements is electrically coupled to a corresponding conductive portion of the one or more conductive portions of the external surface, wherein the one or more electrical contacts are positioned along the internal surface and are electrically isolated from each other, wherein each of the one or more electrical contact elements is electrically coupled with one of the lead connector elements of the plurality of lead connector elements when the lead connector is received within the lumen,

wherein the one or more conductive portions of the external surface of the first adapter that are electrically coupled to the one or more electrical contact elements of the first adapter are located in the same location along the external surface thereof as the one or more conductive portions of the external surface of the second adapter that are electrically coupled to the one or more electrical contact elements of the second adapter, wherein at least one electrical contact element of the one or more electrical contact elements of the first adapter is located in a different location along the internal surface thereof than the one or more electrical contact elements of the second adapter, wherein at least a portion of the electrically isolative material of the first adapter is located in the same location along the internal surface thereof as at least one of the one or more electrical contact elements of the second adapter, and further at least a portion of wherein the electrically isolative material of the second adapter is located in the same location along the

internal surface thereof as at least one of the one or more electrical contact elements of the first adapter,

wherein each adapter of the first adapter and the second adapter is configured to be used separately from one another to electrically connect the lead connector to the implantable medical device.

14-15. (Canceled)

16. (Previously Presented) A kit for coupling a lead connector to a medical device, wherein the medical device comprises a connector bore defining an inner surface, wherein the lead connector comprises a plurality of lead connector elements electrically isolated from one another and spaced apart along the lead connector, wherein the kit comprises a plurality of adapters, wherein the plurality of adapters comprises:

a first adapter and a second adapter, wherein each adapter of the first adapter and the second adapter is configured to be used separately from one another to electrically connect the lead connector to the medical device, wherein each of the first and the second adapters extends from a proximal end to a distal end and defines an opening configured to receive the lead connector, wherein each of the first and the second adapters further defines an external surface to engage the inner surface of the connector bore of the medical device when the adapter is received therein and an inner surface defining at least a portion of the opening to engage the lead connector when the lead connector is received therein, wherein each of the first and the second adapters comprises:

an external contact element along the external surface to electrically couple to a conductive portion on the inner surface of the connector bore of the medical device when the adapter is received therein,

electrically isolative material along the internal surface, and

an internal contact element along the internal surface to electrically couple to one lead connector element of the plurality of lead connector elements when the adapter

receives the lead connector within the opening, wherein the internal contact element is electrically coupled to the external contact element,

wherein the external contact element of the first adapter is located along the external surface of the first adapter in the same location as the external contact element of the second adapter, wherein the internal contact element of the first adapter that is electrically coupled to the external contact element of the first adapter is located along the internal surface of the first adapter in a different location than the internal contact element of the second adapter that is electrically coupled to the external contact of the second adapter, wherein at least a portion of the electrically isolative material of the first adapter is located in the same location along the internal surface thereof as the internal contact element of the second adapter, and further wherein at least a portion of the electrically isolative material of the second adapter is located in the same location along the internal surface thereof as the internal contact element of the first adapter.

17. (Previously Presented) The kit of claim 16, wherein the plurality of lead connector elements of the lead connector comprises:

a first lead connector element, and

a second lead connector element,

wherein the internal contact element of the first adapter is located along the internal contact surface to contact the first lead connector element when the lead connector is received within the opening of the first adapter and the internal contact element of the second adapter is located along the internal contact surface to contact the second lead connector element when the lead connector is received within the opening of the second adapter.

18. (Previously Presented) The kit of claim 17, wherein at least a portion of the electrically isolative material of the first adapter electrically isolates the second lead connector element from the internal contact element of the first adapter when the lead connector is received within the opening of the first adapter, and wherein at least a portion of the electrically isolative material of the second adapter electrically isolates the first lead connector element from the internal contact

element of the second adapter when the lead connector is received within the opening of the second adapter.

19. (Previously Presented) The kit of claim 16, wherein the internal contact element of the first adapter is located along the internal contact surface a first distance away from the proximal end of the first adapter, wherein the internal contact element of the second adapter is located along the internal contact surface a second distance away from the proximal end of the second adapter, and wherein the first distance and the second distance are different.

20. (Previously Presented) The kit of claim 16, wherein the external contact element of each of the first and the second adapters comprises a ring contact.

21. (Cancelled)

22. (Previously Presented) The kit of claim 16, wherein the external surface of each of the first and the second adapters comprises a label, and further wherein the label of the external surface of the first adapter is different than the label of the external surface of the second adapter to distinguish between the first adapter and the second adapter.